



## Manual for motor FM 120 i2 - FS

### *Safety instructions.*

*It is imperative that you read before handling and using the motor this notice and study the motor manual. If you not find answers to your questions, consult with a more experienced colleague, contact your dealer engine or contact the manufacturer directly.*

*Remember that engine, what you bought is not a toy and is designed only to drive the airplane models under the terms of the instructions for assembly and use. In the case of our products, it is a big volume motors and performance, thus this requirement is more important.*

***If the motor or the whole model with this motor provide another person, tell him safety instructions and operating instructions. If you do these guidelines and / or instructions lost or destroyed, you can re-download them from our website.***

***Please take great care in securing the motor in model and check it regularly. Likewise, check the propeller mounting screw.***

***It is not allowed to move when the engine is running in the plane of rotation of the propeller and in front of it (in the case of classical, towing arrangement - CW). Attention to touch the spinning propeller! When you start your model and warming up the motor well secured against rolling away, preferably with qualified persons.***

***Do not allowed to play near the running motor small children and bad moving people also make sure pets.***

***Before every start, pay attention to the condition of the propeller. Damaged, chipped or unbalanced propeller can dismantle the entire model, motor pull from model, no matter how well done by you and even fatally injure persons standing nearby. Do not attempt to repair a damaged propeller, it is very dangerous and it always prefer to immediately replace for the same type and parameters. Use a good quality propeller manufacturers, designed for petrol motors. We recommend using propellers Fiala, which is developed and produced by ourselves.***

***Do not start the engine in an enclosed space, but only in open spaces.***

***After stoping the motor, keep in mind that the whole motor including muffler is very hot and can cause burns. Therefore let the motor before checking or servicing to cool down completely.***

***Follow the rules of fire safety, smoke, etc., model and motor is full of petrol. Likewise, please protect your eyes and mucous membranes before the petrol.***

***Please follow the general rules for your own safety and also for bystanders and use your own common sense according to the principle - what could theoretically happen, will also one day become.***

***Note .: Our advice to the conclusion - many modelers have for complex, large and expensive models prepared their own list of performing pre and control operations, so-called - Check List. It can still be advantageously incorporate a list of specific control operations on the motor and drive unit as a whole.***

## 1. Motor application

Motor FM 120 i2 – FS is a 4-stroke gasoline motor with volume 120 ccm and is designed for use in model aircraft. It is not designed or recommended for any other use.

## 2. Description of the motor

It is a 4-stroke motor with OHV and 2 valves per cylinder. Microprocessor ignition for easy starting and smooth running in all modes of engine speed.

## 3. Fuel

Use unleaded gasoline with a minimum octane 95 mixed **with synthetic oil designed for two-stroke engines.**

For running we recommend 1:25, after running 1:30. Run-in should take about 2 hours of operation.

We recommend Valvoline oil - SynPower 2T - Full Synthetic, Mobil 1 - Racing 2T - Full Synthetic or Repsol - Moto2T Racing. If you are not sure about the suitability of oil, which is going to use, contact authorized service center or the manufacturer directly.

## 4. Propeller

With the engine FM 120 i2 - FS we recommend the following propellers: two-blade 30/12, 30/14, 32/12. Three-blade 28/14 – 30/ 14. *For best results use Fiala propellers.*

With these propellers motor should be measured on the ground to achieve optimum speed, ie approx. 4500 - 5000 rev / min. When installing and using the propeller observe strictly all safety recommendations propeller manufacturer. Propeller is mounted on motor by a central bolt M10x 1 and six screws around the perimeter of the flange.

## 5. First start of the motor

Properly attach the motor to the model or the test stand using all four screws. Connect the ignition source (4.8 - 9V, min. capacity of 1500 mAh). Connect the fuel tank.

- Make sure that the ignition is switched off
- Close the choke
- 5-6 x crank the motor in order to suck fuel
- Adjust slightly increased idle speed cca 10%
- Turn on the ignition
- Start the motor
- If after about 5 attempts, the engine does not start, repeat the procedure again

Note : ignition is equipped with a security protection function, because if it is turned on and the motor is more than a minute at rest, the ignition is switched off. In this case, it is only the ignition off and on again. For more information see the instructions on electronic ignition.

## 6. Starting the motor

### Cold motor

- Make sure that the ignition is switched off
- Close the choke
- 3-4 times to spin the engine, in order to draw fuel
- Open the choke and set the full throttle
- 1 x spin the motor
- Set a slightly increased idle speed of about 3-8% (must be tested on a specific motor)
- Turn the ignition
- Start the motor

### Warm motor - up to 4 minutes of engine stalling

- Turn the ignition
- Set a slightly increased idle speed of about 3-8% (must be tested on a specific motor)
- Start the motor

### Warm motor - five minutes after the engine stalling

- Make sure that the ignition is switched off
- Close the choke
- 1 x spin the motor
- Open the choke
- when it is 1-cylinder motor set full throttle and 1 x spin the motor

- Set a slightly increased idle speed of about 3-8% (must be tested on a specific motor)
- Turn the ignition
- Start the motor

If a situation arises that the engine will not start, there was either a glut motor fuel, or vice versa engine is lean.

Because these conditions can be difficult to detect, we recommend the following procedure:

- Check the fuel system (leaks, throughput, level of fuel etc.).
- Make sure that the ignition is switched off
- Set full throttle
- 10 x spin the motor
- Turn the ignition
- Set a slightly increased idle speed of about 3-8% (must be tested on a specific motor)
- Start the motor

If the engine can no longer run, we recommend:

- Make sure that the ignition is switched off
- Close the choke
- 3-4 times to spin the motor, in order to draw fuel
- Open the choke and set the throttle
- 1 x spin the motor
- Set a slightly increased idle speed of about 3-8% (must be tested on a specific motor)
- Turn the ignition
- Start the motor

If the engine still does not start, it is necessary to contact an authorized service center or the manufacturer directly.

## 7. Running motor

Each motor is factory-tested and adjusted to the basic setting. Use a fuel with a higher ratio of oil (see section 3 of this manual), ie. 1:25. While running is not recommended long term exceed the motor speed 2500 / min while controlling the temperature of the engine. Do not keep a constant speed but motor flush with the occasional addition / slow down the gas. This mode observe about the first 30 minutes of operation. After a short time, you can gradually increase the speed up to 4000 / min. Total time of run is about 2 hours.

## 8. Install the motor inside the model

When thinking about the placement of the engine into the model, keep in mind that it is **absolutely necessary to ensure proper cooling**. Use the 4 screws to attach the motor to the motor mount. Engine mount directly without dampers. Use self-locking nuts and / or thread adhesive of medium strength. For our engines can not use a muffler designed for two-stroke motors! Our recommended muffler, its size and weight, go to [www.fialaprop.com](http://www.fialaprop.com), or to inform on e-mail: [valachmotors@fialaprop.cz](mailto:valachmotors@fialaprop.cz)

## 9. Motor maintenance

The motor is designed and constructed to require as little maintenance. Valve clearance is checked every 3 hours of operation of the motor and yet the valves lubricated. At the same time checks the condition of the spark plugs and ignition battery status.

### 9.1. Adjusting valve clearances – only on cold motor!

The correct valve clearance is cold engine 0.1 mm. Is set with the gauge attached and keys.

1. Remove the valve cap
2. Turn propeller to remain both valves as well ajar
3. Then turn the propeller in the same direction by one revolution
4. Adjust the valve clearance - see the following text
5. Lubricate the rocker - see section 9.2
6. Replace the valve cover

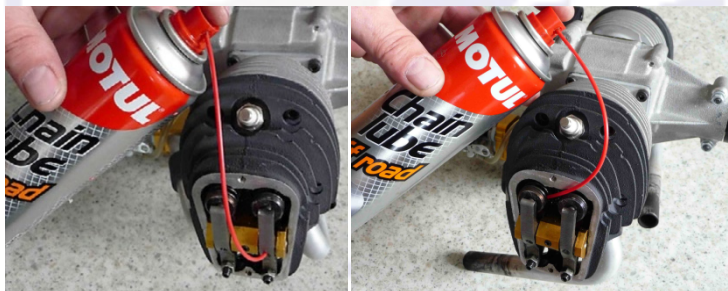
Setting procedure: loosen the nut, place the gauge between the rod and rocker arm and adjust gradual screwing clearance so that the gauge was sliding grip. Then tighten the nut again. After tightening recheck valve clearance. More tells you the following three photos. A system of adjustment is a classic - cut right valve adjusts the left and vice versa.



## 9.2. Lubrication rockers

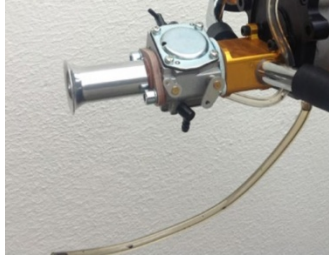
Always when checking / adjusting valve lash perform simultaneously lubricate the rocker. We recommend oil **Motul Chain lube Off road** or similar quality oil for lubrication of motorcycle chains with temperature determining to 150 ° C. How and where to apply grease is seen in the photograph.

At the same time, or at least from time to time it is necessary to check the cleanliness of the motor, status / battery condition for ignition and the gap between the spark plug electrodes. This should be set to **0.4 mm**. When the electrodes are burnt, replace the spark plug.



## 10. Carburetor

The standard motors mounted Walbro carburetor. Such carburetors are fitted along side by two adjusting rotating needles marked H (high) and L (low). Needle labeled H is used to adjust the carburetor / motor at maximum RPM and needle bearing L turn affects low speeds and transitions to the midrange. Basic settings of the two needles is 2 turns, calculated from tight needles. Fine adjustment and tuning of the engine should be performed by fitting the model.



On this photo is also seen ventilation hose crankcase. This tubing is not clogged and leave it in its original length!

**11. List of common spare parts and accessories**

Find the [www.fialaprop.com](http://www.fialaprop.com), or to inform on e-mail: [valachmotors@fialaprop.cz](mailto:valachmotors@fialaprop.cz)

**12. Motor repair**

If, during the warranty period there is a problem or failure, please contact your dealer, who will help you solve the problem, or contact the manufacturer.

We wish you a lot of satisfaction with our product!

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